

CLAIMS

We claim:

1. A gasification reactor vessel, comprising:

2 a pressure shell, said pressure shell having an encircling body wall and

3 shell ends at each of opposite ends of the body wall;

4 a plurality of cooling ducts extending around an outer surface of said

5 body wall, said ducts being fixedly connected to said outer surface, interior spaces of said

6 cooling ducts communicating with said outer surface;

a fluid supply conduit communicating with said cooling ducts;

a fluid discharge conduit communicating with said cooling ducts; and

a lining of a refractory encircling an inner surface of said encircling

10 body wall.

2. A gasification reactor vessel according to claim 1, wherein each cooling

2 duct comprises a pair of spaced webs fixedly connected at common edges of each to said body

3 wall outer surface, and an arcuate segment joining opposite edges of said webs.

1 3. A gasification reactor vessel according to claim 2, wherein the webs of

2 each duct are fixedly connected to said body wall outer surface with welded connections.

1 4. A gasification reactor vessel according to claim 2, wherein said ducts

2 extend longitudinally of said body wall, said fluid supply and fluid discharge conduits are

3 annular and located, respectively, at one of two opposite ends of said shell body.

1 5. A gasification reactor vessel according to claim 4, wherein said ducts
2 each are spaced on said body wall outer surface circularly from ducts adjacent thereto.

1 6. A gasification reactor vessel according to claim 4, wherein said ducts are
2 arrayed circularly around said body wall outer surface with each duct in abutment with ducts
3 adjacent thereto.

1 7. A gasification reactor vessel according to claim 2, wherein said ducts
2 extend circularly around said body wall outer surface, said fluid supply and fluid discharge
3 conduits being annular and disposed, respectively, at one of two opposite ends of said shell
4 body .

5 8. A gasification reactor vessel according to claim 7, wherein said ducts are
6 arranged obliquely of a central axis of said body wall

7 9. A gasification reactor vessel according to claim 8, wherein said ducts
8 extend in a spiral course around said body wall outer surface.

9 10. A gasification reactor vessel according to claim 7, wherein each duct
10 encircles said body outer wall surface spaced from ducts adjacent thereto.

11 11. A gasification reactor vessel according to claim 1, wherein said
12 refractory lining comprises at least two separate concentric layers of refractory material.

1 12. A gasification reactor vessel according to claim 11, wherein the
2 refractory material is at least one of a ceramic and polytetrafluoroethylene.

3 reacting said fuels, residues and waste with an oxygen-containing

4 oxidizing agent in a reaction space of a pressure vessel of a fly stream reactor, said pressure
5 vessel having a refractory lining therein; and

regulating a temperature of said pressure vessel so that said temperature is above a dew point temperature of any water contained in a gas atmosphere present in said reaction space.

14. A method according to claim 13 further comprising setting a pressure of
the coolant flowable in said ducts irrespective of a pressure present in said reaction space,
whereby the temperature of said pressure vessel can be regulated for maintaining said pressure
vessel temperature above a dew point temperature in the reaction space.

1 15. A method according to claim 13, wherein the temperature of said
2 pressure vessel is regulated to be more than at least about 5° C above the dew point of any gas
3 atmosphere water present in said reaction space.

1 16. A method according to claim 13, wherein said pressure vessel has
2 cooling ducts on an outer surface of said pressure vessel for regulating the temperature of said

3 ~~pressure vessel with coolant flowable through said ducts, and regulating pressure vessel~~

4 temperature with coolant which is above or below coolant boiling point.

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